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RESEARCH NOTE 99/10

**PEACE SUPPORT OPERATIONS AND THE
REVOLUTION IN MILITARY AFFAIRS**

A Question of Relevancy

by

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Dr. Elinor C. Sloan

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ABSTRACT/ RÉSUMÉ

This paper examines the applicability of the Revolution in Military Affairs (RMA) to peace support operations by looking at the degree to which key RMA technologies and doctrines were or were not relevant, useful or effective during NATO's operation in and around Kosovo in the spring of 1999. It concludes that many, but not all, of the technologies and doctrines are relevant to peace support operations, but it qualifies this by the fact that the Kosovo operation fell at the higher intensity end of the peace support spectrum. Some elements of the RMA that were useful here may not be applicable to missions at the lower end of the spectrum, such as humanitarian assistance or traditional peacekeeping. A full understanding of the RMA's relevance to peace support operations would require a look at additional missions. Nonetheless, it seems clear that the RMA, and particularly the combination of precision force and advanced battlespace awareness and control capabilities, has done much to increase the options available to leaders when responding to conflict short of war.

Ce document contient un examen de l'applicabilité du concept de Révolution dans les affaires militaires (RAM) aux opérations de paix. Plus précisément, il vise à déterminer dans quelle mesure les technologies et les doctrines liées à la RAM ont été pertinentes, utiles ou efficaces lors de l'opération menée par l'OTAN au Kosovo et dans les régions environnantes, au printemps 1999. On en arrive à la conclusion qu'un grand nombre de ces technologies et de ces doctrines (mais pas toutes) sont utiles dans le cadre des opérations de paix ; on nuance cependant ce propos en soulignant que l'opération montée au Kosovo comptait parmi les opérations de paix de plus grande intensité. Certains éléments de la RAM ont servi dans ce cas, mais risquent de ne pas s'appliquer aux missions de moins grande intensité, par exemple les opérations d'aide humanitaire ou les opérations classiques de maintien de la paix. Pour bien comprendre l'applicabilité du concept de RAM aux opérations de paix, il faudrait examiner d'autres missions. Néanmoins, il semble clair que la RAM, et plus particulièrement la combinaison de la force de précision et de capacités perfectionnées de contrôle et de connaissance de l'espace de combat, ont grandement contribué à l'élargissement des options qui s'offrent aux dirigeants confrontés à des conflits qu'on ne saurait qualifier de guerre.

SOMMAIRE

1. Ce document contient un examen de l'applicabilité du concept de Révolution dans les affaires militaires (RAM) aux opérations de paix. Il vise donc à déterminer dans quelle mesure les changements technologiques et doctrinaux clés liés à la RAM se sont avérés pertinents, utiles ou efficaces durant l'opération menée par l'OTAN au Kosovo et dans les régions environnantes, au printemps 1999.

2. Un élément central de la RAM est l'usage de la force de précision, plus précisément de munitions à guidage de précision. L'OTAN a eu recours à diverses munitions de ce genre au Kosovo et dans cette région du monde. Signalons notamment les munitions interarmes d'attaque directe larguées par des bombardiers B-2, les missiles de croisière lancés par les bombardiers B-52 et les missiles de croisière *Tomahawk* tirés par des navires de l'OTAN (ces trois types d'arme sont guidés par des satellites), ainsi que des bombes à guidage laser larguées à partir d'avions de chasse. Comme il y avait souvent une couverture nuageuse au-dessus de la Yougoslavie et que cela empêchait les pilotes de bien «accrocher» les cibles, les systèmes guidés par satellite se sont avérés essentiels.

3. Le cas du Kosovo ne donne pas une idée claire de l'utilité de la force de précision dans le cadre d'une opération de paix. La campagne aérienne tactique de l'OTAN a été moins efficace que prévu, étant donné qu'environ un tiers seulement des chars et des transports de troupes blindés de la Serbie ont été détruits par les avions des alliés durant l'opération qui s'est étalée sur 78 jours. La campagne stratégique a été beaucoup plus efficace, la puissance aérienne de l'OTAN ayant détruit une grande partie de l'infrastructure essentielle de la Serbie. Cela a permis à l'Alliance d'atteindre son objectif politique plus vaste qui consistait à forcer le président de la Serbie, Slobodan Milosevic, à accepter un accord de paix négocié répondant aux exigences de l'OTAN. Toutefois, d'autres facteurs importants sont entrés en ligne de compte, par exemple la menace d'une opération terrestre montée par l'OTAN et l'isolement diplomatique de la Serbie par rapport à la Russie.

4. Des progrès technologiques considérables ont également été accomplis sur un autre plan, soit les moyens de collecte de renseignements, de surveillance et de reconnaissance (ISR), et les capacités de commandement, de contrôle, de communication, d'informatique et de traitement du renseignement (C4I). Un certain nombre de systèmes ISR et C4I ont été employés lors de l'opération menée au Kosovo, y compris des avions de surveillance au sol dotés d'un radar interarmes de surveillance et d'attaque (JSTARS), des avions équipés du système aéroporté de détection et de contrôle, des véhicules aériens télépilotes et de nombreux satellites. Or, en dépit du vaste éventail de capteurs perfectionnés, l'OTAN a parfois eu de la difficulté à localiser les troupes et l'équipement des Serbes. L'Alliance a également été confrontée à des problèmes de commandement et de contrôle parce que les alliés qui se servaient de systèmes C4I plus anciens ne pouvaient recevoir l'information provenant des systèmes plus avancés des Nord-Américains. Néanmoins, les technologies ISR et C4I perfectionnées qui sont liées à la RAM ont acquis une certaine notoriété durant l'opération effectuée au Kosovo en raison de leur performance, et on peut s'attendre qu'elles joueront un rôle clé dans le cadre d'opérations de paix futures.

5. Un élément important de la RAM est l'augmentation de la capacité de projection de la puissance grâce aux technologies furtives. Le bombardier furtif B-2 a fourni un rendement impressionnant durant l'opération menée au Kosovo : il a attaqué des objectifs stratégiques avec une précision de 90 p. 100, ce qui donne à penser que les plates-formes furtives joueront un rôle dans le cadre des futures missions d'imposition de la paix. Cependant, les spécialistes soulignent que la principale tendance liée à la puissance aérienne stratégique consistera à utiliser des plates-formes de combat sans équipage. Cela est également vrai de la puissance aérienne tactique, étant donné que les véhicules aériens de combat télépilotes pourraient être tout aussi efficaces que les chasseurs, sans pour autant mettre en péril la vie des pilotes.

6. Sur le plan de la doctrine, l'un des principaux changements découlant de la RAM est l'adoption de forces terrestres plus petites, plus rapides, plus mobiles et plus souples mais ayant néanmoins une grande puissance de destruction. Les technologies clés incluent des chars et des transports de troupes blindés plus petits et légers qui protègent cependant très bien les membres d'équipage, ainsi que des munitions de précision, des moyens de transport stratégique aérien et maritime, de même que des hélicoptères de transport et de combat qui assurent la mobilité sur le champ de bataille. La plupart des caractéristiques des forces terrestres qui découlent de la RAM cadrent bien avec la nature des opérations de paix actuelles : en effet, les soldats de la paix doivent être capables d'intervenir rapidement lorsqu'il se produit une situation de crise et, une fois qu'ils sont sur le théâtre des opérations, ils sont souvent confrontés à des routes étroites ou à une infrastructure quasi inexistante ainsi qu'à un milieu instable et dangereux.

7. Cela dit, la décision de ne pas recourir à des hélicoptères de combat Apache au Kosovo, ainsi que la réticence plus générale de l'OTAN à déployer des forces terrestres lors de l'opération, soulève des questions au sujet du rôle qui sera rempli par l'armée de terre au cours d'opérations futures. Les forces terrestres sont indispensables à certains types de mission de paix, comme les missions de mise en oeuvre d'accords de paix. En revanche, dans le cas des opérations de paix d'une plus grande intensité, c'est-à-dire les opérations d'imposition de la paix, il se peut que l'armée de terre ait un moins grand rôle à jouer. L'utilité des hélicoptères de combat lors des opérations de paix est mise en doute encore davantage, puisque l'imposition de la paix est leur rôle le plus plausible et que le recours à ces hélicoptères ne s'est pas avéré une option viable dans le cas qui nous intéresse. À l'avenir, on pourra difficilement affirmer que les hélicoptères de combat conviennent à la fois aux opérations de guerre de haute intensité et aux opérations de paix.

8. Un élément doctrinal clé de la RAM est la collaboration de plus en plus étroite entre les services, notamment la tendance de la Marine à participer de plus en plus à des opérations de guerre sur le littoral. Les opérations menées par l'OTAN au Kosovo et dans cette région confirment ces deux tendances et, par le fait même, l'utilité de ces concepts dans le cas des opérations de paix. Les plans opérationnels prévoyaient que les avions JSTARS appuieraient non seulement la campagne aérienne, mais également les unités d'hélicoptères et les unités terrestres de l'armée de terre, si celles-ci avaient été déployées au Kosovo. L'offensive terrestre de l'Armée de libération du Kosovo à la fin de mai 1999 a démontré l'importance de la coordination entre les forces aériennes et les forces terrestres. Par ailleurs, une bonne partie

des attaques de précision ont été effectuées au moyen de missiles de croisière Tomahawk lancés à partir de navires américains et britanniques sur le littoral de l'Adriatique.

9. Ainsi, une analyse pragmatique des opérations militaires effectuées au Kosovo et dans les environs indique qu'un grand nombre des technologies et des doctrines clés de la RAM (mais pas toutes) s'appliquent aux opérations de paix. Il faut nuancer cette affirmation en précisant que l'opération menée au Kosovo était une mission d'*imposition de la paix* et qu'elle faisait partie des opérations de paix de plus grande intensité. Certaines des technologies et des doctrines qui ont été utiles au Kosovo ne pourraient probablement pas s'appliquer à des missions de moins grande intensité, comme les opérations d'aide humanitaire ou les opérations classiques de maintien de la paix. Pour bien évaluer la pertinence de la RAM par rapport aux opérations de paix, il faudrait examiner des missions supplémentaires.

10. En fait, la question la plus intéressante ne consiste peut-être pas à se demander si la RAM s'applique aux opérations de paix, mais plutôt si la RAM augmente (ou réduit) les options des décideurs chargés de gérer des situations de crise. Il faut souligner que, dans le cas du Kosovo, il ne s'agissait pas de choisir entre le recours à la puissance aérienne ou le déploiement d'une force terrestre. En réalité, les seules options viables sur le plan politique étaient les suivantes : faire appel à la puissance aérienne ou ne pas du tout utiliser la force militaire. De ce point de vue, il est clair que la RAM, et plus particulièrement la combinaison de la force de précision et les capacités ISR et C4I avancées, ont grandement contribué à élargir les options des dirigeants qui sont confrontés à des conflits qui ne sont pas qualifiés de guerre.

EXECUTIVE SUMMARY

1. This paper examines the RMA's applicability to peace support operations by looking at the degree to which key technological and doctrinal changes associated with the RMA were or were not relevant, useful or effective during NATO's operation in and around Kosovo in the spring of 1999.

2. Central to the RMA is the application of precision force using precision guided munitions. NATO used an array of such in and around Kosovo. They included Joint Direct Attack Munitions dropped from B-2 bombers, conventional air launched cruise missiles launched from B-52 bombers, and *Tomahawk* cruise missiles fired from NATO ships—all of which are satellite-guided—as well as laser guided bombs launched from fighter aircraft. Because frequent cloud cover over Yugoslavia made it difficult for pilots to achieve and maintain a laser "lock" on targets, the use of satellite-guided systems proved particularly critical.

3. The Kosovo case gives a mixed assessment as to the utility of precision force in a peace support operation. NATO's tactical air campaign was less effective than originally anticipated, with only about a third of Serbia's tanks and armored personnel carriers being destroyed by allied warplanes during the 78-day operation. The strategic campaign was far more effective with NATO air power destroying much of Serbia's critical infrastructure. This assisted the Alliance in achieving its broader political objective of forcing Serbian President Slobodan Milosevic to agree to a negotiated peace settlement on NATO's terms, although other important factors also came into play such as the threat of a NATO ground operation and Serbia's diplomatic isolation from Russia.

4. A second area of significant technological advance is intelligence gathering, surveillance and reconnaissance (ISR) means, and in command, control, communications, computers and intelligence processing (C4I) capabilities. A number of ISR and C4I systems were at work during the Kosovo operation, including Joint Surveillance Target Attack Radar System (JSTARS) ground surveillance aircraft, Airborne Warning and Control System aircraft, unmanned aerial vehicles and numerous satellites. But despite the array of advanced sensor technology, NATO had at times difficulty locating and tracking Serb troops and equipment. The Alliance also experienced command and control problems because allies using older C4I systems could not receive information from America's more technologically advanced systems. Nonetheless, advanced ISR and C4I technologies associated with the RMA gained stature during the Kosovo operation as a result of their performance and they can be expected to play a key role in future peace support operations.

5. An important element of the RMA is increased power projection capability through the use of stealth technologies. The stealthy B-2 bomber performed impressively during the Kosovo operation, hitting strategic targets with 90 percent accuracy and lending support to the view that stealthy platforms will have a role in future peace enforcement missions. Experts stress, however, that the real move in strategic air power will be towards unmanned combat platforms. This is true too of tactical air power in that unmanned combat aerial vehicles may be just as effective as fighter aircraft and without the concerns for pilot safety.

6. On the doctrinal front, one of the major changes associated with the RMA is a trend towards smaller, more rapidly mobile and flexible ground forces that are still highly lethal. Key technologies include smaller and lighter tanks and armored personnel carriers that still afford troops significant protection, precision munitions, strategic sea and airlift, and transport and combat helicopters for mobility on the battlefield. Most of these RMA ground force attributes correspond well to the nature of today's peace support missions where peacekeepers must be able to respond quickly to a crisis, and once in theatre are often greeted with narrow or non-existent roads and infrastructure, and a volatile and dangerous operating environment.

7. That said, the ultimate decision not to use Apache combat helicopters in Kosovo, coupled with NATO's more general reluctance to commit ground forces to the operation, raises questions for the army as to the role it will play in future operations. Ground forces are indispensable for certain kinds of peace support mission, such as peace implementation after a settlement has been reached. But for the higher-intensity form of peace operation, that is to say peace enforcement, it may be that the army will have less of a role. The utility of combat helicopters in peace support operations is even more in question considering peace enforcement is their most plausible peace support mission and, at least in this instance, they were proven not to be a viable option. In the future, it will be difficult to view combat helicopters as a platform that is cross-suited both to high-intensity war and peace support operations.

8. A key doctrinal element of the RMA is increased jointness among the services, part of which involves a move towards littoral warfare on the part of the Navy. NATO operations in and around Kosovo confirmed trends in both these areas and, by extension, the relevance of these concepts to peace support operations. Operational plans called for JSTARS aircraft to support not only the air campaign but also Army ground and helicopter units, had they been deployed to Kosovo. The Kosovo Liberation Army ground offensive in late May 1999 demonstrated the importance of joint air-ground coordination. And a significant portion of the precision strikes were carried out using Tomahawk cruise missiles launched from US and British ships in the Adriatic littorals.

9. Thus a pragmatic analysis of military operations in and around Kosovo indicates that many, but not all, of the RMA's key technologies and doctrines are relevant to peace support operations. This statement must be qualified by the fact that the Kosovo operation was a *peace enforcement* mission and, as such, fell at the higher intensity end of the peace support spectrum. Some of the technologies and doctrines that were useful here may not be -- indeed, probably would not be -- applicable to missions at the lower end of the spectrum, such as humanitarian assistance or traditional peacekeeping. A full understanding of the RMA's relevance to peace support operations would require a look at additional missions.

10. Perhaps the more interesting question is not so much the relevance of the RMA to peace support operations but whether the RMA increases (or decreases) policy-makers' options in managing a crisis. Here it is important to remember that the alternatives in Kosovo were not between using air power or sending in a ground force. Rather, the politically viable

choice was between applying air power or not using military force at all. From this perspective it seems clear that the RMA, and particularly the combination of precision force and advanced ISR and C4I capabilities, has done much to increase the options available to commanders when responding to conflict short of war.

THE RMA AND PEACE SUPPORT OPERATIONS: *A Question of Relevancy*

Introduction

1. Over the past few years there has been much debate in foreign and defence policy circles about the Revolution in Military Affairs (RMA). Of the many dimensions this debate has taken, one of the most important is the question of relevancy. How relevant is the RMA and its associated technologies and doctrines to the types of conflicts Canada and its allies are most likely to face in the foreseeable future? Few would question that the RMA is well suited to high-intensity war against a modern, advanced conventional armed force. But this is only one contingency along the broad spectrum of possible conflict scenarios, and many would argue it is the least likely in the near to medium term. Rather, most of the conflicts the Western world is likely to address will be low-intensity in nature and involve unconventional paramilitary units or less advanced conventional forces. The requirement will be less for high-intensity warfare to reverse military aggression between states, and more for peace support operations—from humanitarian assistance to peacekeeping to peace enforcement and post-conflict peace-building—in response to an intrastate conflict.

2. Advocates of the RMA argue that it is a flawed approach for policy makers to focus on conflict frequency. The Western world, they argue, must be prepared for the most *important* contingency, not necessarily the most frequent, and it is a fallacy to equate importance with frequency.¹ Nonetheless, it is equally erroneous to create a military that cannot be used in the majority of conflict situations. "What's the point of having this superb military that you're always talking about if we can't use it?" Secretary of State Madeleine Albright once asked of Chairman of the Joint Chiefs of Staff General Colin Powell.² The threat or actual use of force is an important tool of diplomacy and to have a military that is only suited to high-intensity warfare is to limit the options available to leaders to influence events and diffuse crises.

3. This paper will look at the RMA's applicability to peace support operations. In particular it will look at some of the key technological and doctrinal changes underway and examine the degree to which they were or were not relevant, useful or effective during NATO's operation in and around Kosovo in the spring of 1999. From this it will draw conclusions as to which areas of the RMA can best be considered as cross-suited to the demands of high-intensity warfare and conflict short of war.

Precision-guided munitions, precision force and disengaged combat

4. The most well known technological advance associated with the RMA is the development of precision-guided munitions. Such munitions were first developed in the latter stages of the Vietnam War but have increased dramatically in terms of accuracy since about

¹ See, for example, David Ochmanek, "Major Theatre War," paper presented at a conference on the Role of Naval Forces in 21st Century Operations, Cambridge, MA, 19-20 November 1997.

² As quoted in Andrew J. Bacevich, "Policing Utopia: The Military Imperatives of Globalization," *National Interest* (Summer 1999), p. 6.

the mid-1980s, and even more so since the Gulf War. Most precision-guided munitions are laser-guided—they travel down a beam of light that is locked by pilot or unmanned aerial vehicle onto a target on the ground. More recently, the United States has developed satellite-guided precision munitions that rely on the Global Positioning System (GPS) and have an all-weather capability.

5. The development of precision technology has engendered two related RMA doctrines. *Precision force* refers to the idea that military force can be used with greater speed, range and accuracy to inflict damage of significantly greater magnitude than was previously the case, and that it can be done so without causing substantial civilian casualties. *Disengaged combat* refers to the concept that force can be applied from a distance using manned aircraft or unmanned aerial vehicles with a sufficient degree of effectiveness that ground forces do not need to be introduced into combat until such time as the risks of intervention in terms of military casualties have been significantly reduced.

6. How useful were precision-guided munitions and their associated doctrines during the Kosovo operation? NATO used an array of precision systems in and around Kosovo. Fighter aircraft from a number of allied countries, including Canada, conducted tactical air strikes using laser-guided bombs. America's B-2 stealth bombers dropped 2000-lb Joint Direct Attack Munitions (JDAMs) from about 40,000 feet, while their B-52 bombers launched conventional air launched cruise missiles (CALCMs) from stand off positions. NATO ships from the United States and Britain added to this array through the coordinated firing of terminally guided *Tomahawk* cruise missiles.

7. Because frequent cloud cover over Yugoslavia made it difficult for pilots to achieve and maintain a laser "lock" on targets, the use of GPS-guided precision systems such as JDAMs, CALCMs and Tomahawks proved particularly critical during the Kosovo operation. To supplement these systems, the US Air Force and Navy modified some of their laser-guided bombs such that they could switch to a GPS system if necessary and hit a target with near precision.³ In the latter stages of the Kosovo operation the Pentagon also deployed the *enhanced paveway* warhead, which is guided through the clouds by GPS and to the final target by laser.⁴

8. The allies also launched unguided systems. B-1B bombers, for example, used synthetic aperture to find targets through clouds and then saturate these targets with "dumb" (unguided) bombs. Better weather and the steady attrition of Serbia's air defences allowed NATO to use an increasing number of unguided weapons as the campaign progressed. As a result, only 35 per cent of the roughly 23,000 bombs and missiles used over the course of the 78-day campaign were precision guided – a figure which is still much higher than the 8 per cent used during the Gulf War.⁵

³ John D. Morrocco, "NATO Vows Air Strikes Will Go the Distance," *Aviation Week & Space Technology*, 29 March 1999, p. 34.

⁴ "NATO's Weapons: Are They Too Clever By Half?," *Economist*, 1 May 1999, p. 46.

⁵ Anthony Cordesman, *The Lessons and Non-Lessons of the Air and Missile War in Kosovo* (Washington, D.C.: Center for Strategic and International Studies, July 1999). NATO conducted a total of 37,465 sorties during the Kosovo air campaign (approximately 150 sorties per day). This compares with 109,870 coalition sorties during the roughly 45-day period of the Gulf War air campaign (approximately 1600 sorties per day).

9. To assess the effectiveness of these weapons, it is important to begin with the objectives of NATO's mission in and around Kosovo. While the overarching goal was to force Slobodan Milosevic, the Serbian president, to agree to a negotiated peace settlement on NATO's terms, the specific military objective was to damage Serbia's capacity to wage war against Kosovo by diminishing or degrading its ability to conduct military operations. A third objective stated by allied leaders soon after bombing began on March 24, 1999 was to avert a humanitarian catastrophe by alleviating the horrific consequences of the systematic cleansing of Kosovar Albanians being prosecuted by Belgrade.

10. Most analysts would agree that the alliance failed to achieve, at least during the air campaign itself, its humanitarian objective. Indeed, experts have argued that the mass expulsion and victimization of Kosovars was aggravated by NATO's exclusive reliance on a long air campaign.⁶ In the closing days of the campaign, White House strategists conceded that stopping "ethnic cleansing" was never seen as a practical goal.⁷ That said, in their initial after action report on the Kosovo operation US Secretary of Defence William Cohen and US Chairman of the Joint Chiefs of Staff Henry Shelton stressed that only three months after the close of the campaign NATO had succeed in rescuing and resettling over one million refugees.⁸

11. The alliance was also less effective than was originally hoped and anticipated in degrading the military capability of the Yugoslav military. Two weeks into the air campaign NATO officials conceded that air power had done little to destroy the front-line Yugoslav armored forces accused of carrying out the worst of the attacks in Kosovo.⁹ This assessment was confirmed at the five week mark,¹⁰ at which time General Wesley Clark, Supreme Allied Commander Europe, also acknowledged that the Serbs had actually beefed up their forces in Kosovo since the air war began.¹¹ The degree to which NATO had not destroyed the actual military capability of the Serbian army became evident after the close of the air campaign in June 1999 when the Serbian Army began withdrawing a greater number of tanks, armored fighting vehicles and artillery batteries than NATO had earlier anticipated. Post-conflict damage assessments confirmed that 93 Serbian tanks had been destroyed by allied warplanes -- far fewer than the 122 announced at the end of the war, which in itself had been a disappointing figure.¹²

⁶ Francois Heisbourg, "Airpower Alone Didn't Force Milosevic's Capitulation," *International Herald Tribune*, 26 June 1999, p. 8.

⁷ Elaine Harden, "Surprising Lesson: Bombing Can Work," *New York Times*, 5 June 1999, p. A6.

⁸ William Cohen and Henry Shelton, "Joint Statement on the Kosovo After Action Review," *OSD News Release*, No. 478-99, 14 October 1999.

⁹ Steven Lee Myers, "Apache Copters May Take Month to be Combat Ready," *New York Times*, 10 April 1999, p. A5.

¹⁰ Craig Whitney, "NATO Chief Admits Bombs Fail to Stem Serb Operations," *New York Times*, 28 April 1999, p. A1.

¹¹ Paul Mann, "NATO Arraigned for 'Strategic Miscalculation'," *Aviation Week & Space Technology*, 3 May 1999, p. 23.

¹² Joseph Fitchett, "NATO Lowers its Tally of Tanks Hit in Kosovo," *International Herald Tribune*, 17 September 1999, p. 5.

12. Alliance officials maintain that although the figures for Serbian losses were lower than expected, the Serbian military still sustained sufficient damage that it could no longer pose a threat to Serbia's neighbors. Indeed, the head of the NATO assessment team argued that the final tally -- which also included 339 military vehicles, 389 artillery pieces and 153 armored personnel carriers -- "amounted to crippling losses for Serbia's regular forces."¹³ But these figures look less impressive when compared to the total number of Serbian tanks and armored personnel carriers in Kosovo -- 350 and 440 respectively ¹⁴-- and lead to the conclusion that in the air and missile war NATO was not as effective as NATO had originally hoped.¹⁵ "The hard fact is," informed observers have argued, "that the mightiest Air Forces in the world were unable to destroy Milosevic's army in the field."¹⁶

13. A number of factors explain why the air and missile campaign in and around Kosovo was militarily less effective than its proponents may have expected. In the first instance, bad weather plagued operations throughout the first weeks of the campaign. Determined to keep civilian collateral damage to an absolute minimum, the Alliance developed rules of engagement that required visual identification of targets, and instructed its pilots to abort those missions that were impeded by cloud cover. As a result, in the first weeks of the campaign almost half of all air combat sorties were unable to attack their assigned targets.¹⁷ Weather problems also placed a greater reliance on satellite-guided systems, which are somewhat less accurate than their laser-guided counterparts.

14. A second factor hindering the tactical effectiveness of the air and missile campaign was the fact that Serbian troops were dispersed throughout the countryside and among the civilian population, making them harder to target. The heavily forested and hilly terrain -- so different from what coalition forces faced during the Gulf War -- made it difficult to pinpoint troops and equipment. The practice of co-locating troops with the civilian population restricted NATO's freedom of maneuver, concerned as it was with limiting civilian casualties.

15. Critics have argued that the air campaign was also hampered by the allies' concern for pilot safety. To hit ground targets with precision, ground-strike aircraft would typically have to drop to about 10,000 feet.¹⁸ However, to ensure the allied aircraft remained out of range of Serbian air defences, allied leaders specified that pilots would not drop below 15,000 feet. Thus the argument that weather hampered precision bombing is only part of the story. "The weather did not prevent bombing, it prevented bombing from above 15,000 feet," argued one well-known defence analyst, "the allies have made it safer to be a NATO pilot than to be a passenger on some Third World airline."¹⁹ By forcing pilots to fly at

¹³ Ibid.

¹⁴ *Aviation Week & Space Technology*, 20 September 1999, p. 25.

¹⁵ Cordesman.

¹⁶ Michael Ignatieff, "The Virtual Commander," *New Yorker*, 2 August 1999, p. 35.

¹⁷ William Drozdiak, "Clark Seeks New Targets All Over Yugoslavia," *International Herald Tribune*, 31 March 1999, p. 1.

¹⁸ Eric Schmitt, "NATO's Claim of a New Focus is Challenged," *New York Times*, 28 March 1999, p. 1.

¹⁹ Edward Luttwak as quoted in Mann, p. 23.

relatively high altitudes, the allied focus on avoiding casualties probably had "a real impact on operational effectiveness."²⁰

16. Finally, the manner in which air power was employed may have been a hindering factor. NATO's original operational plans called for a campaign of gradual escalation, beginning with limited attacks and building in sufficient pauses for Belgrade to capitulate.²¹ The first phase was to focus on military targets such as air defence sites, command and control facilities, armored units and aircraft repair facilities, while the second phase would widen the target base to include the strategic targets that ultimately support Serbia's ability to wage war. But air power proponents have argued that the best way to achieve results would have been an immediate and overwhelming application of air power.²² By attacking targets sequentially instead of in parallel, they maintain, NATO undermined the disruptive shock effect that should be the key aim of a modern air assault.²³ "This is not Instant Thunder," one air force officer lamented 10 days into the campaign, "it's more like Constant Drizzle."²⁴ For Lieutenant General Michael Short, NATO's joint force air component commander during the Balkan operation, the "massive and laborious tank plinking effort in Kosovo was in many ways a waste of time" since it did little to achieve NATO goals.²⁵

17. While the tactical air war had disappointing results, the strategic campaign was far more effective. In May 1999 the Alliance began to focus more on installations like oil refineries, power plants, bridges and roads that civilians also use. NATO air power proved capable of eliminating virtually all of Serbia's oil-refining capacity, reducing its oil stockpiles by half, seriously disrupting its transportation arteries, and cutting power to most of Belgrade.²⁶ Air strikes also did serious damage to the Yugoslav military's logistical infrastructure, military barracks, and the military-industrial base.

18. Some experts have argued that the operation would have been more successful if NATO had focused on strategic targets from the outset. In testimony before a US Senate Committee General Short argued the alliance should "have gone for the head of the snake on the first night," knocking out the electrical power grid that serves Belgrade, as well as strategic bridges on the Danube River.²⁷ However many allies opposed such strikes in the early stages of the operation for fear they would accidentally cause significant numbers of civilian casualties and turn Western public opinion against the war.

19. The one area where the Alliance fully achieved its goal was in the broader political objective of forcing Milosevic to agree to a negotiated peace settlement on NATO's terms. On 10 June 1999 the alliance secured a settlement that improved markedly on that which had

²⁰ James A. Kitfield, "Another Look at the Air War That Was," *Air Force Magazine* (October 1999), p. 43.

²¹ Joanna McGeary, "Kosovo Crisis: The Way Forward," *Time*, 12 April 1999, p. 27.

²² Robert Holzer, "Questions Swirl Around NATO Air Campaign," *Defense News*, 12 April 1999, p. 4.

²³ "Aerial Warfare," *Oxford Analytica Brief*, 20 October 1999.

²⁴ John D. Morrocco, "Weather, Weapons Dearth Slow NATO Strikes," *Aviation Week & Space Technology*, 5 April 1999, p. 26.

²⁵ John A. Tirpak, "Short's View of the Air Campaign," *Air Force Magazine* (September 1999), p. 43.

²⁶ Ivo Daalder and Michael O'Hanlon, "Unlearning the Lessons of Kosovo," *Foreign Policy* (Fall 1999).

²⁷ John Diamond, "Senior US General Criticizes France, Other Allies for Extending Kosovo War," *New York Times*, 23 October 1999, p. A1.

been negotiated at Rambouillet, France the previous February, and ultimately rejected by Milosevic. Under the new settlement, all Serbian forces were withdrawn from Kosovo, a large NATO-led force (KFOR) has been deployed with robust rules of engagement, and, backed by NATO, a UN transitional administration (UNMIK) is establishing control of the area. As a result, life in the province for Kosovar Albanians is much better than it was before NATO's use of force.²⁸

20. Achieving the settlement was due in large part to the air campaign, but the timing suggests that other factors were also at play. First, actions by the Kosovo Liberation Army (KLA) played a contributing role. In late May 1999 a revitalized KLA launched ground offensives that forced Serbian units to concentrate and expose their armor and troops, thus making them fully vulnerable to NATO air power for the first time during the war.²⁹ "The single most important data point of the war," argues Michael O'Hanlon of the Brookings Institution, "was that 80 per cent of all Serbian armor losses occurred in the last two-and-a-half weeks, precisely when the KLA offensive began."³⁰ Without the KLA offensive, NATO's already limited tactical success against the Yugoslav army would likely have been marginal.

21. A second factor was growing signals from NATO that it was considering a ground invasion. As the bombing began in March 1999 President Clinton declared that "I do not intend to put our troops in Kosovo to fight a war."³¹ But in the middle of May he began to move away from this position, framing ground troops instead as a possible option. Meanwhile, NATO took the decision to increase its presence along the Macedonian border to 50,000 soldiers. The perception of a potential ground invasion was reinforced by the deployment to Albania of the US Army's Task Force Hawk, which included two dozen *Apache* helicopters (to be discussed below). Finally, late in May key NATO defence ministers met "secretly" in Bonn to discuss ground force options – a meeting that was promptly leaked to the press. The combined effect of these actions may have been to convince Milosevic that even if he withstood the intensified air campaign, there was no way out of the conflict short of accepting NATO's terms for a peace settlement.

22. A final factor in achieving the settlement was Milosevic's growing diplomatic isolation. US Deputy Secretary of State Strobe Talbott has confirmed that the United States "repeatedly and explicitly" warned Russia not to provide Yugoslavia with any material assistance, stating that to do so would have a "devastating" effect on the future of US-Russian relations.³² Calculating that vital elements of its national interests lay with America, not Serbia, Russia sharply limited its practical support to the Federal Republic of Yugoslavia (although it strongly opposed the air war in public statements), and was prepared to work with NATO diplomatically to end the conflict. After Russia agreed in early June 1999 that some form of an international security force with NATO at its core needed to be deployed to

²⁸ Daalder and O'Hanlon.

²⁹ Ibid.

³⁰ As quoted in Paul Mann, "Kosovo's Lessons Called Ambiguous," *Aviation Week & Space Technology*, 28 June 1999, p. 32.

³¹ Barton Gellman, "The Path to Crisis: How the United States and its Allies Went to War," *International Herald Tribune*, 19 April 1999, p. 2.

³² Ignatieff, p. 36.

Kosovo Milosevic realized that he had become politically isolated and could expect no substantial help from Russia.³³

23. Thus it can be concluded that the air and missile campaign was critical to achieving the Alliance's political objectives, but other important factors also came into play. The activities of the KLA, NATO's overt preparations for a ground invasion, and Serbia's complete diplomatic isolation made significant contributions to the outcome. The limited success of the tactical air war, the greater effectiveness of the strategic air war, and the complete success of the broader diplomatic effort indicate that although NATO did not decisively win the battle, it certainly won the war.

Battlespace awareness and advanced ISR; battlespace control and advanced C4I

24. A second key area of technological advance associated with the RMA is in intelligence gathering, surveillance and reconnaissance (ISR) means, and in command, control, communications, computers and intelligence processing (C4I) capabilities. Advanced ISR is dramatically improving "battlespace awareness" -- the age-old battlefield challenge of "seeing beyond the next hill." Today sensors in satellites, manned and unmanned aircraft offer commanders the possibility for real-time knowledge of the location of all enemy and friendly forces on the battlefield within an area of about 200 square kilometers. At the same time, advanced C4I promises significant improvements in "battlespace control" to the point that, at least in theory, commanders will be able to control events on the battlefield from one moment to the next. Working together, advanced ISR and C4I have the potential to significantly reduce what Clausewitz termed the "fog of war."

25. Intuitively, it is not difficult to imagine that advanced battlespace awareness and control technologies are ideal candidates for those that are cross-suited to high intensity war and peace support operations. Just as reliable ISR is central to warfighting, "precise knowledge of how many refugees are moving where, how and under what conditions is critical for effective action."³⁴ So too is knowledge of the location of those forces a coalition is trying to target. "The primary challenge in irregular operations is in *identifying* the enemy, not defeating it once it is found. This places a premium on surveillance and intelligence gathering."³⁵ As for advanced C4I, those capabilities pursued for high-intensity war are also very relevant to peace support operations. Both types of operation require real-time, integrated communications that links together all military formations.³⁶ Moreover, because both are increasingly characterized by many nations working together, measures designed to improve multilateral command and control will enhance effectiveness across the spectrum of operations.

26. A number of battlespace awareness and control technologies were at work during the NATO operation in and around Kosovo. Joint Surveillance Target Attack Radar System

³³ Cohen and Shelton.

³⁴ Joseph S. Nye and William A. Owens, "America's Information Edge," *Foreign Affairs* (March/April 1996), p. 24.

³⁵ Michael J. Mazarr et al., *The Military Technical Revolution* (Washington, D.C.: Center for Strategic and International Studies, March 1993), p. 50.

³⁶ Mazarr, p. 52.

(JSTARS) ground surveillance aircraft located targets and monitored troop concentrations in all weather conditions. Airborne Warning and Control System (AWACS) aircraft provided airspace surveillance and directed air-to-air fighters in their operations to provide protection to ground-strike fighters and bombers. Tactical unmanned aerial vehicles (UAVs) like the US Army *Hunter* operated below cloud-level to provide crucial battlefield reconnaissance on such things as the location of Serbian troops hidden in bunkers or woods. They then sent these images directly back to combat aircraft loitering overhead.³⁷ Higher altitude US Air Force *Predator* UAVs, which are equipped with synthetic aperture radar and can find targets through cloud cover, augmented the JSTARS.³⁸ Finally, more than 50 American and European satellites made up of between 15 and 20 different space system types were directly involved in NATO intelligence gathering and strike operations. The systems included reconnaissance, weather, navigation, military communications, data relay and signals intelligence spacecraft.³⁹

27. Despite this array of advanced sensor technology, NATO was not entirely successful in tracking events on the battlefield. When Serbian troops closed the border crossing points from Kosovo into Macedonia and Albania in early April 1999 NATO reconnaissance planes were unable to locate the tens of thousands of refugees that had been turned back.⁴⁰ Sensors also had difficulty locating Serb troops and equipment. One month into the operation "NATO's commanders still seem[ed] unsure where exactly in Kosovo the Serbs' 40,000 troops and 400 or so armored vehicles actually [were]."⁴¹

28. In the area of area of command and control NATO faced challenges because allies using older C4I systems could not receive information from America's more technologically advanced systems. US aircraft equipped with the advanced Joint Tactical Information Distribution System data links, for example, could not use them and had to rely on voice communications instead to ensure situational awareness among all allied aircraft. According to US intelligence these conversations were almost certainly monitored and acted upon by the Yugoslav forces – an indication that interoperability problems between and among allies came to impact on military effectiveness.⁴²

29. Despite these difficulties, advanced ISR and C4I technologies associated with the RMA gained stature during the Kosovo operation as a result of their performance. America's JSTARS proved so valuable for their ability to track targets through cloud cover that US Air Force officials predict Congress will increase the number of aircraft buys from 13 to 19.⁴³ The older AWACS aircraft demonstrated their worth as a platform capable of coordinating

³⁷ Elizabeth Becker, "They're Unmanned, They Fly Low, and They Get the Picture," *New York Times*, 3 June 1999, p. A15.

³⁸ Morrocco, "Weather, Weapons Dearth," pp. 28-29.

³⁹ Craig Covault, "Military Space Dominates Air Strikes," *Aviation Week & Space Technology*, 29 March 1999, p. 31.

⁴⁰ Craig R. Whitney, "NATO Reconnaissance Fails to Locate Missing Refugees," *New York Times*, 10 April 1999, p. A7.

⁴¹ "NATO's Weapons," p. 47.

⁴² David A. Fulghum, "Data Link, EW Problems Pinpointed by Pentagon," *Aviation Week & Space Technology*, 6 September 1999, p. 87.

⁴³ David A. Fulghum and Robert Wall, "Joint-STARS May Profit From Yugoslav Ops," *Aviation Week & Space Technology*, 26 July 1999, p. 74.

and tracking offensive and defensive air missions, searching for enemy aircraft, assuring safe separation of inbound and exiting aircraft, and directing refueling efforts – all with an extremely high (98 percent during the Kosovo operation) accuracy rate.⁴⁴ At a time when keeping allied casualties to a minimum was uppermost in leaders' minds, UAVs provided critical battlefield information that would otherwise have to have been gathered by low flying (and therefore vulnerable to enemy fire) aircraft. In the aftermath of the war General Clark identified UAVs as "essential tools for success in future combat."⁴⁵ Finally, satellites proved crucial for ensuring the allies had an all-weather reconnaissance and, especially, precision force capability. Based on this experience, it can be expected that most precision munitions in the future will be satellite-guided or a combination of laser and satellite guided.

Power projection and stealth

30. A key element of the RMA is increasing power projection capabilities. In part this comes from making ground forces lighter and more rapidly mobile (to be discussed below), but it also involves technological advances that enable air force platforms to travel further, longer and to have more room for maneuver once they are in the battle area. The critical technological advance of military significance in this latter area is in low observable technologies or stealth.

31. The Kosovo operation reaffirmed the lesson of the Gulf War that the American F-117A stealth fighter is a highly effective platform for carrying out those missions where non-stealthy aircraft would be placed at undue risk of being hit by enemy anti-aircraft fire. This despite the fact that one stealth fighter that was shot down early in the campaign. The real "surprise" of the Kosovo air campaign was the proven accuracy and reliability of the B-2 stealth bomber. The US Air Force had long boasted that the B-2 gave it "global reach, global power," but this was the first time it had demonstrated such capability in a sustained campaign.⁴⁶ Flying 31-hour round trips from Whitman Air Force Base, Missouri, the B-2's carried out 33 missions, hitting with 90 percent accuracy targets such as Serbia's integrated air defence system, command and control sites, runways and airfields, communications facilities, factories, bridges and other elements of infrastructure.⁴⁷ "Given the weather, the enemy order of battle, and the targets, the B-2 with its stealth capability was the right one to go in there," stated the Air Force commander in charge of the bombers.⁴⁸ In the aftermath of the war, General Clark identified continued reliance on stealth aircraft as a key lesson of the Kosovo operation.

⁴⁴ Paul Proctor, "Aging NATO AWACS Prove Reliable in Balkans Campaign," *Aviation Week & Space Technology*, 30 August 1999, p. 43.

⁴⁵ Greg Seigle, "NATO Chief Outlines Lessons From Kosovo," *Jane's Defence Weekly*, 8 September 1999, p. 4.

⁴⁶ Bradley Graham and Dana Priest, "Professional Consensus: No Way to Fight a War," *International Herald Tribune*, 7 June 1999, p. 8.

⁴⁷ John A. Tirpak, "With Stealth in the Balkans," *Air Force Magazine* (October 1999), p. 24.

⁴⁸ Mann, "NATO Vows Air Strikes Will Go the Distance," 29 March 1999, p. 34.

32. Experts argue that, strategically, the air war gave strong evidence of the continuing usefulness of long-range bombers, including the B-2, the B-1 and the B-52. Interestingly however, this evidence is not viewed as "the harbinger of a new B-3."⁴⁹

Rather, the case is made that power projection should in future increasingly focus on stealthy, unmanned strategic platforms. Harvard's Richard Falkenrath, for example, believes the Kosovo conflict may trigger a renaissance in strategic air power, not in the sense of building a new stealth bomber, but with a movement away from expensive platforms and towards unmanned aerial vehicles.⁵⁰

33. Others go still further, arguing that the future will see a growing use of UAVs not just for surveillance but also for combat. The Kosovo operation demonstrated both that it is difficult to fight an air war from above the clouds, and that allied leaders are hesitant to send manned aircraft below the clouds. Logically speaking, then, these trends are likely to drive air forces towards unmanned combat aerial vehicles (UCAVs). "Why use a \$50 million fighter plane, protected by a UAV, when UAVs could do the whole job?"⁵¹ For his part, Secretary of Defence Cohen anticipates that the US Air Force will "eventually become a UCAV force," but, he stresses, "we are not there yet."⁵²

Smaller, more rapidly mobile and flexible ground forces

34. On the doctrinal front, one of the major changes associated with the RMA is a move towards smaller, more rapidly mobile and flexible ground forces that are still highly lethal. Achieving such a force has three key aspects. First, the structure and equipment of the force itself must change dramatically from the heavy, deployed-in-place character of Cold War ground forces. Second, such a force must have access to strategic sea and (especially) airlift for rapid deployment to the battle area. And third, transport and combat helicopters are necessary for achieving battlefield mobility.

35. As with advanced ISR and C4I capabilities, it is not difficult to imagine how the rapidly deployable and agile ground force aspect of the RMA would be highly relevant to peace support operations. The smaller, more highly skilled, professional army units that would be called upon to fight a future high-intensity war (and *were* called upon to fight the Gulf War) would also be well suited to the complexity of peace support missions. This is particularly the case considering that peace operations are conducted "out-of-area" where Allies with conscript troops often face legal hurdles to deployment. At the same time, smaller and lighter tanks and armored personnel carriers that still afford the troops significant protection and -- armed with precision munitions -- are still highly lethal, would correspond well to the nature of today's peace support missions where peacekeepers are often greeted with narrow or non-existent roads and infrastructure, and a volatile and dangerous operating environment.

⁴⁹ Paul Mann, "Kosovo's Lessons Called Ambiguous," *Aviation Week & Space Technology*, 28 June 1999, p. 32.

⁵⁰ *Ibid.*, p. 36.

⁵¹ Defence analyst quoted in *ibid.*

⁵² Comments before a conference on "Strategic Responsiveness: Early and Continuous Joint Effectiveness Across the Spectrum," Washington, D.C., 2 November 1999.

36. Whether a force is responding to a high-intensity war scenario or a peace support situation, it will need to be rapidly deployable to the battle area. "The pressures of dealing with conflicts that fall short of all-out warfare," specialists inside and outside the Pentagon have argued, "should drive the United States and its allies to develop more expeditionary forces geared to getting troops to remote places rapidly."⁵³ This places a premium on strategic sea and airlift – a capability that is equally central to responding effectively to a high-intensity war. The RMA also calls for the increased use of transport and combat helicopters for mobility on the battlefield. Here, too, there is some resonance with peace support operations, particularly with respect to transport helicopters since poor road conditions often make helicopters the only viable means of moving within the theatre.

37. The applicability of combat helicopters to peace support operations is less clear-cut. Soon after the Kosovo air campaign began General Clark requested the deployment of Apache combat helicopters because they were far better suited than high flying strike aircraft to degrading the Yugoslav ground forces. But the US political leadership hesitated to grant the request for fear the deployment might be mistaken as a sign the United States was willing to send ground troops to Kosovo before a peace settlement was reached. From the outset of the campaign, NATO leaders had publicly announced that no ground forces would be employed in Kosovo, except as part of a peace implementation force.⁵⁴ US officials were also concerned that the low flying, slow moving Apache's would "show up like lighted Christmas trees" on Serb radar and be vulnerable to automatic-weapon ground fire or short-range shoulder-fired missiles.⁵⁵ In a campaign where the United States strove towards a "zero casualty" goal such considerations played a key role in decision-making.

38. After Clinton ordered two dozen Apache's and their associated support personnel and equipment to Albania in early April 1999, these twin considerations continued to hold back a final decision to deploy into Kosovo. Congressional officials argued the authorization indicated the allies were "clearly moving towards a ground war in Kosovo,"⁵⁶ while military officials said they feared the Apaches would be shot down with relative ease.⁵⁷ Almost two months into the campaign Pentagon officials continued to argue that the operational environment was "too dangerous" to deploy the helicopters.⁵⁸ In the end, the Apaches were never used in combat. Instead, the Alliance deployed A-10 *Warthogs*, a low-flying, slow attack plane armed with *Maverick* anti-tank missiles. "Most of what the Apache's could do can be done by the A-10s with less risk," argued President Clinton.⁵⁹ Even these platforms were ordered to fly at higher than optimum altitude for much of the campaign, making the aircraft less effective.⁶⁰

⁵³ Graham and Priest.

⁵⁴ John D. Morrocco, "Kosovo Conflict Highlights Limits of Airpower and Capability Gaps," *Aviation Week & Space Technology*, 17 May 1999, p. 31.

⁵⁵ Michael Duffy and Douglas Waller, "Inside Clinton's War," *Time*, 19 April 1999, p. 26.

⁵⁶ Eric Schmitt, "With Dispatch of Gunships, US Crosses a Threshold," *International Herald Tribune*, 6 April 1999, p. 4.

⁵⁷ Steven Lee Myers, "Apaches Will Face High Risk Over Kosovo," *New York Times*, 1 May 1999, p. A10.

⁵⁸ Robert Wall, "NATO Endgame, Helos Stir Debate," *Aviation Week & Space Technology*, 24 May 1999, p. 38.

⁵⁹ *Ibid.*, p. 37.

⁶⁰ *Ibid.*, p. 38.

39. The ultimate decision not to use combat helicopters in Kosovo, coupled with NATO's more general reluctance to commit ground forces to the operation, raises questions for the army as to the role it will play in future operations. Ground forces are indispensable for certain kinds of peace support operation, such as peace implementation after a settlement has been reached. But for the higher-intensity form of peace support mission, that is to say peace enforcement, the role of the army is less certain. Although some of the allies, notably as Britain, were quite favorable to the idea of sending ground forces to Kosovo, others, including the United States (as was indicated above) were very hesitant.

40. The utility of combat helicopters in peace support operations is even more in question considering peace enforcement is their most plausible peace support mission and, at least in this instance, they were proven not to be a viable option. "Clearly, everybody was stumped when the 24 Apaches were sent [to Albania] and no one knew what to do with them."⁶¹ The Apache's were acclaimed for their success during the Gulf War where, faced with easier terrain, better weather and less potent enemy air defences, the Apaches destroyed scores of Iraqi tanks and vehicles with only one helicopter loss.⁶² But, in the future, it will be difficult to view combat helicopters as a platform that is cross-suited both to high-intensity war and peace support operations.

41. The crux of the problem lies not in terrain or weather or the sophistication of air defences, but in a complex mix of political will, interests and the degree to which leaders are willing to sustain military casualties. Broadly speaking, high-intensity war responds to a threat to vital interests while peace support missions more often than not address threats to core values – things that offend our conscience and fuel our outrage but do not, in the final analysis, threaten our livelihood or way of life. At the same time, it can be generally stated that ground forces are at greater risk of sustaining casualties than are other services, save perhaps the Marines for those countries that have them. This combination of factors means that (again, generally speaking) political leaders would be less willing to employ ground troops in a peace enforcement mission than in a high-intensity war.

42. That being said, if the army *is* to be used in a future peace enforcement operation it must become more mobile. "The lesson [of Kosovo] for the army is, its not going to be in the game unless it develops some sort of medium-weight force that it can deploy rapidly"⁶³ – a prescription that is entirely in line with RMA theory. A good example of the still limited rapid mobility of the US military (which in turn is in advance of all other nations) was the difficult logistical experience of deploying the Apache helicopters. Originally, officials had anticipated the helicopters would be ready for combat within 7 to 10 days of the decision to move into theatre. But a slow moving US army structure, coupled with a bottleneck over Albania due to the airlift of refugee relief supplies, set this timetable back by several weeks. Officials stated that a key problem was the "weight" of the force. Although the helicopters themselves flew to Albania, their accompanying support structure – rocket batteries, armored

⁶¹ Mann, "Kosovo's Lessons," p. 36.

⁶² Myers, "Apaches Will Face," 1 May 1999, p. A10.

⁶³ Defence specialist quoted in Graham and Priest.

vehicles, and equipment to set up a secure base for 2,800 soldiers – required some 150 cargo flights from Germany.⁶⁴

43. The US Army has sustained significant criticism that it was not mobile enough to participate in combat operations in Kosovo. In response, officials have noted that the service has been developing ways to integrate the lethality of heavy formations with the mobility of lighter ones for some time, but that such force structure changes can only move so quickly.⁶⁵ Nonetheless, analysts contend that the Kosovo experience is likely to prompt a new look at how the US Army deploys and how much airlift it needs.⁶⁶ “The army is something of a strategic dinosaur and it badly needs to restructure the ‘army right now’ rather than waiting for the ‘army after next,’” argued an early Kosovo after-action report.⁶⁷ This is even more so the case for most allied armies, many of which are less strategically mobile than their American counterparts for “out-of-area” operations.

Jointness and littoral warfare

44. A central doctrinal element of the RMA is a move towards increased jointness among the services and combinedness among the armed forces of different countries. The RMA foresees an increasingly integrated battlefield with the Army, Navy and Air Force working ever more closely together. In such a setting Air Force precision force assets would prepare the battlefield for ground forces, while airlift assets would get them there. Manned, unmanned and satellite surveillance assets would operate throughout the campaign and support all three services. Naval forces would provide off shore logistical support, sea lift and precision force capabilities against ground targets. It follows that part of this increased jointness involves a move towards littoral warfare on the part of the Navy.

45. Both jointness and littoral warfare are concepts that have direct relevance to peace support operations. Even before the Kosovo (and Bosnian) operation US experts argued that joint, precision strike forces that coordinated the fire of naval, air and ground units might be useful in peace enforcement efforts. The case was also made that, both for combined arms operations and peace support missions, the US Navy would have to become more capable of operating close to shore.⁶⁸

46. NATO operations in and around Kosovo provided some confirmation of the trend towards jointness and, by extension, of the concept’s relevance to peace support operations. In the early stages of the mission military planners broadened the operational plan for JSTARS from supporting only the air campaign to assisting Army ground and helicopter units. Had the Apaches been deployed to Kosovo, the two platforms would have worked closely together. The surveillance aircraft would have orbited before the attack helicopters launched in order to provide an updated view of Yugoslav forces, and would have used voice

⁶⁴ Myers, “Apache Copters May Take Month,” p. A1.

⁶⁵ Bryan Bender, “Kosovo Lessons Won’t Mean Big Changes by USA,” *Jane’s Defence Weekly*, 14 July 1999.

⁶⁶ David Fulghum, “Data Link, EW Problems Pinpointed by Pentagon,” *Aviation Week & Space Technology*, 6 September 1999, p. 88.

⁶⁷ Cordesman. *The Army After Next* program focuses on transforming the US Army to meet the geostrategic requirements of the period 2010 to 2025.

⁶⁸ Mazarr, pp. 49 & 54.

communications to direct the helicopters while they were flying.⁶⁹ The KLA ground offensive in late May 1999, which increased air power effectiveness by forcing Serb units out into the open, also demonstrated the importance of joint air-ground coordination.⁷⁰

47. The Kosovo operation also reinforced the conceptual move away from navy-to-navy conflict in the open seas and towards littoral warfare with the navy working in concert with air and ground forces. A significant portion of the precision strikes were carried out using Tomahawk cruise missiles launched from US and British ships in the Adriatic littorals. Indeed, in the early stages of the campaign inclement weather meant that the GPS-guided Tomahawk was a "critical asset" in expanding the Alliance's options for achieving its military and political objectives.⁷¹

Conclusion

48. A pragmatic analysis of military operations in and around Kosovo provides a mixed assessment as to the relevance of key RMA technologies and doctrines to peace support operations. Precision force and precision guided munitions achieved only limited results against tactical military targets but were very effective against strategic targets. This allowed NATO to ultimately reach its overall political objective, but not without the help of a number of other important factors. Advanced C4I and, especially, ISR capabilities were impressive, but their employment also revealed specific limitations. Measures to improve high-resolution sensing through clouds and to ensure interoperable command and control among allies can only enhance NATO's ability to effectively carry out peace support operations. Strategic bombers proved very useful for their power projection capability, but in the future the key platform for power projection in a high-intensity war and peace support operation alike may well be stealthy unmanned combat aerial vehicles. Although the role of the army in a future Kosovo-type operation is unclear, ground forces still remain highly relevant to lower intensity missions such as peace-implementation and to missions where political leaders are prepared to sustain a certain number of military casualties. In all cases, ground forces must become lighter, more flexible and rapidly deployable. This means smaller organizational units, lighter yet lethal equipment that affords troops sufficient protection, and rapid deployment by substantially increased air and sea lift assets. Finally, the Kosovo operation demonstrated beyond reasonable doubt that the RMA doctrines of jointness and littoral warfare are not only relevant and useful to peace support operations, but central to the future employment of allied forces in this type of military engagement.

49. Notwithstanding the above, the degree to which the RMA is relevant to peace support operations must be qualified by the fact that NATO's operation in and around Kosovo was a peace enforcement mission and, as such, fell at the higher intensity end of the peace support spectrum. Some of the technologies and doctrines that were useful here may not be – indeed, probably would not be – applicable to missions at the lower end of the spectrum, such as humanitarian assistance or traditional peacekeeping. The relevance of some aspects of the

⁶⁹ Robert Wall, "Joint-STARS Changes Operational Scheme," *Aviation Week & Space Technology*, 3 May 1999, pp. 25 & 29.

⁷⁰ *Oxford Analytica Brief*.

⁷¹ Joseph Fitchett, "Cruise Missiles Enhance NATO's Scope," *International Herald Tribune*, 5 April 1999, p. 9.

RMA to peace support operations has already been substantiated by other missions. In Bosnia, for example, many believe that precision force helped get the warring parties to the peace table in the fall of 1995, and UAVs have been monitoring implementation of the Dayton Accords since 1996. But it is difficult to see what precision force or littoral warfare could contribute to the resolution of a conflict, say, in central Africa. Clearly, a full understanding of the RMA's relevance to peace support operations would require a look at a number of missions.⁷²

50. Perhaps the more interesting question is not so much the relevance of the RMA to peace support operations but whether the RMA increases (or decreases) policy-makers' options in managing a crisis. Experts are mixed as to the final meaning of the Kosovo operation. Many take the lesson that air power alone cannot effectively address an intra-state conflict and that ground forces are still required. Others are convinced that air power has finally reached its decades-old promise of being the decisive force in war. But wherever one comes down on this issue it is important to remember that the alternatives in Kosovo were not between using air power or sending in a ground force. Rather, the politically viable choice was between applying air power or not using military force at all. From this perspective it seems clear that the RMA, and particularly the combination of precision force and advanced ISR and C4I capabilities, has done much to increase the options available to leaders when responding to conflict short of war.

⁷² Somalia, Angola, Liberia and Congo could perhaps provide the basis of such an analysis.

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This paper examines the applicability of the Revolution in Military Affairs (RMA) to peace support operations by looking at the degree to which key RMA technologies and doctrines were or were not relevant, useful or effective during NATO's operation in and around Kosovo in the spring of 1999. It concludes that many, but not all, of the technologies and doctrines are relevant to peace support operations, but it qualifies this by the fact that the Kosovo operation fell at the higher intensity end of the peace support spectrum. Some elements of the RMA that were useful here may not be applicable to missions at the lower end of the spectrum, such as humanitarian assistance or traditional peacekeeping. A full understanding of the RMA's relevance to peace support operations would require a look at additional missions. Nonetheless, it seems clear that the RMA, and particularly the combination of precision force and advanced battlespace awareness and control capabilities, has done much to increase the options available to leaders when responding to conflict short of war.

Ce document contient un examen de l'applicabilité du concept de Révolution dans les affaires militaires (RAM) aux opérations de paix. Plus précisément, il vise à déterminer dans quelle mesure les technologies et les doctrines liées à la RAM ont été pertinentes, utiles ou efficaces lors de l'opération menée par l'OTAN au Kosovo et dans les régions environnantes, au printemps 1999. On en arrive à la conclusion qu'un grand nombre de ces technologies et de ces doctrines (mais pas toutes) sont utiles dans le cadre des opérations de paix, on nuance cependant ce propos en soulignant que l'opération montée au Kosovo comptait parmi les opérations de paix de plus grande intensité. Certains éléments de la RAM ont servi dans ce cas, mais risquent de ne pas s'appliquer aux missions de moins grande intensité, par exemple les opérations d'aide humanitaire ou les opérations classiques de maintien de la paix. Pour bien comprendre l'applicabilité du concept de RAM aux opérations de paix, il faudrait examiner d'autres missions. Néanmoins, il semble clair que la RAM, et plus particulièrement la combinaison de la force de précision et de capacités perfectionnées de contrôle et de connaissance de l'espace de combat, ont grandement contribué à l'élargissement des options qui s'offrent aux dirigeants confrontés à des conflits qu'on ne saurait qualifier de guerre.

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